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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/781,709	02/20/2004	Tomohiro Sakai	089367-0123	4198

22428 7590 08/22/2007
FOLEY AND LARDNER LLP
SUITE 500
3000 K STREET NW
WASHINGTON, DC 20007

EXAMINER	
MEHRMANESH, ELMIRA	
ART UNIT	**PAPER NUMBER**
2113	

MAIL DATE	DELIVERY MODE
08/22/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

MN

Office Action Summary	Application No.	Applicant(s)	
	10/781,709	SAKAI, TOMOHIRO	
	Examiner	Art Unit	
	Elmira Mehrmanesh	2113	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 June 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *20 February 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

This action is in response to an amendment filed on June 08, 2007 for the application of Sakai, for a "Disk array device" filed February 20, 2004.

Claims 1-21 are pending in the application.

Claims 1-21 are rejected under 35 USC § 103.

Specification

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Uchida (U.S. Patent No. 6,330,620) in view of Tsurumaki (JP Pub No. 2001-256000).

As per claim 1, Uchida discloses a disk array device including a component that can be degraded (Fig. 1) and comprising:

a trouble point storage unit, which stores a point value of the component (Fig. 2, element 12)

a point update unit, which subtracts a predetermined point value from the point value stored in said trouble point storage unit and stores the subtracted point value in said trouble point storage unit, when a processing fault occurs on the component (Fig. 5)

a degradation unit (col. 2, lines 39-41) which degrades the component when the point value stored in said trouble point storage unit falls below a reference value (col. 2, lines 63-67)

Uchida fails to explicitly disclose adding a point value after a predetermined time period passes.

Tsurumaki teaches:

a trouble point recovery unit, which adds an another predetermined point value to the point value stored in said trouble point storage unit, when a predetermined time period passes since the trouble point recovery unit had added to the point value a last time (paragraphs [0023] through [0026]).

It would have been obvious to one of ordinary skill in the art at the time the invention to use the method of Arrayed I/O unit close decision of Uchida in combination with the disk array device of Tsurumaki for a higher reliability array system.

One of ordinary skill in the art at the time the invention would have been motivated to make the combination because Uchida discloses an upgrade step for adding a constant B to the counter upon a normal operation of an I/O unit in response to an access; a downgrade step for subtracting a constant C from the counter upon an operation failure on an I/O unit (col. 2, lines 9-12). Tsurumaki disclose a disk array device wherein the value assigned to each magnetic disk in a cumulative timer table is incremented if a fault occurs and when the cumulative value exceeds a threshold, the corresponding disk device is disconnected (paragraphs [0023] to [0025]).
Using the upgrade and downgrade method will provide reliable system performance (Uchida, col. 2, lines 1-15).

As per claim 2, Uchida discloses a disk array device including a component that can be degraded (Fig. 1) and comprising:

a trouble point storage unit, which stores a point value of the component (Fig. 2, element 12)

a point update unit, which adds a predetermined point value from the point value stored in said trouble point storage unit and stores the added point value in said trouble point storage unit, when a processing fault occurs on the component (Fig. 5)

a degradation unit (col. 2, lines 39-41) which degrades the component when the point value stored in said trouble point storage unit falls below a reference value (col. 2, lines 63-67)

Uchida fails to explicitly disclose adding a point value after a predetermined time period passes.

Tsurumaki teaches:

a trouble point recovery unit which adds an another predetermined point value to the point value stored in said trouble point storage unit, when a predetermined time period passes since the trouble point recovery unit had added to the point value a last time (paragraphs [0023] through [0026]).

As per claim 3, Uchida discloses a disk array device, which can degrade a plurality of disks (Fig. 1) and comprises:

a trouble point storage unit, which stores point values of each disk (Fig. 2, element 12)

a point update unit, which subtracts a predetermined point value from the corresponding point value stored in said trouble point storage unit and stores the subtracted point value in said trouble point storage unit, when a processing fault occurs on one of the disks (Fig. 5)

a degradation unit (col. 2, lines 39-41) which degrades the component when the point value stored in said trouble point storage unit falls below a reference value (col. 2, lines 63-67)

Uchida fails to explicitly disclose adding a point value after a predetermined time period passes.

Tsurumaki teaches:

a trouble point recovery unit which adds an another predetermined point value to the point value stored in said trouble point storage unit, when a predetermined time period passes since the trouble point recovery unit had added to the point value a last time (paragraphs [0023] through [0026]).

As per claim 4, Uchida discloses disk array device further comprises a processing-time-reference exceeding case point update unit which subtracts a predetermined point value from the point value stored in said processing-time-reference exceeding case table, in a case where a processing time for a required processing exceeds a reference time on a disk (Fig. 5)

wherein said degradation unit (col. 2, lines 39-41) degrades a corresponding disk when the point value stored in said trouble case table falls below a first reference value or the point value stored in said processing-time-reference exceeding case table falls below a second reference value (col. 2, lines 63-67)

Uchida fails to explicitly disclose a table.

Tsurumaki teaches:

wherein said trouble point storage unit comprises a trouble case table (Fig. 2) storing point values of each disk and a processing-time-reference exceeding case table storing point values of each disk; wherein said trouble case point update unit updates

point value stored in said trouble case table (paragraph [0022]).

As per claim 5, Uchida discloses a point initialization unit which sets, in a case where a defective disk is replaced, a point value corresponding to the defective disk stored in said trouble point storage unit to an initial value (Fig. 3).

As per claim 6, Uchida discloses degradation unit receives a point update notification concerning a disk number from said trouble case point update unit, and determines whether the point value stored in said trouble point storage unit in association with the disk number is equal to or lower than a predetermined reference value, and degrades a disk having the disk number in a case where determining that the point value is equal to or lower than the reference value (col. 2, lines 27-67).

As per claim 7, Uchida discloses point update unit notifies information indicating that the point value has been updated to said degradation unit (col. 2, lines 61-67).

As per claim 8, Uchida discloses a disk array device (Fig. 1) comprising:

a trouble point storage unit, which stores a point value of the component (Fig. 2, element 12)

a point update unit, which subtracts a predetermined point value from the point value stored in said trouble point storage unit and stores the subtracted point value in

said trouble point storage unit, when a processing fault occurs on the component (Fig. 5)

a processing rate adjusting unit which lowers a processing rate of a component in a case where the point value of the component stored in said trouble point storage unit becomes equal to or lower than a reference value, and sets the processing rate of the component to a predetermined normal state in a case where the point value of the component stored in said trouble point storage unit exceeds the reference value (col. 7, lines 21-30)

Uchida fails to explicitly disclose adding a point value after a predetermined time period passes.

Tsurumaki teaches:

a trouble point recovery unit which adds an another predetermined point value to the point value stored in said trouble point storage unit, when a predetermined time period passes since the trouble point recovery unit had added to the point value a last time (paragraphs [0023] through [0026]).

As per claim 9, Uchida discloses a disk array device, which can degrade a plurality of disks (Fig. 1) comprising:

a trouble point storage unit, which stores point values of each disk (Fig. 2, element 12)

a point update unit, which subtracts a predetermined point value from the corresponding point value stored in said trouble point storage unit and stores the

subtracted point value in said trouble point storage unit, when a processing fault occurs on one of the disks (Fig. 5)

a processing rate adjusting unit which lowers a processing rate of a disk in a case where the point value of the disk stored in said trouble point storage unit becomes equal to or lower than a reference value, and sets the processing rate of the disk to a predetermined normal state in a case where the point value of the disk stored in said trouble point storage unit exceeds the reference value (col. 7, lines 21-30)

Uchida fails to explicitly disclose adding a point value after a predetermined time period passes.

Tsurumaki teaches:

a trouble point recovery unit which adds an another predetermined point value to the point value stored in said trouble point storage unit, when a predetermined time period passes since the trouble point recovery unit had added to the point value a last time (paragraphs [0023] through [0026]).

As per claim 10, Uchida discloses the plurality of disks is mirrored (Fig. 1, element 31)

said processing rate adjusting unit lowers a processing rate of a disk and raises a processing rate of a disk paired with the disk in a case where the point value of the disk stored in said trouble point storage unit becomes equal to or lower than the reference value, and sets the processing rate of the disk and the processing rate of the paired disk to the predetermined normal state in a case where the point value of the disk stored in

said trouble point storing unit exceeds the reference value (col. 7, lines 21-30).

As per claim 11, Uchida discloses processing rate adjusting unit reads the point values of each disk storing in said trouble point storage unit; determines whether or not the point value change from greater than the reference value to equal to or lower than the reference value, and lowers a processing rate of a disk in a case where determining that the point value of the disk change to equal to or lower than the reference value (col. 7, lines 21-30) and determines whether or not the point value change from equal to or lower than the reference value to greater than the reference value, and adjusts a processing rate of a disk so as to set a predetermined initial rate in a case where determining that the point value of the disk change to greater than the reference value (col. 7, lines 21-30).

As per claim 12, Uchida discloses a component degradation method in which a disk array device, having a plurality of components degradable (Fig. 1) and a memory storing point values regarding each of the plurality of components (Fig. 2, element 12), comprises:

subtracting a predetermined point value from the point value stored in said memory and storing the subtracted point value in said memory, when a processing fault occurs on one of the components (Fig. 5)

Uchida fails to explicitly disclose adding a point value after a predetermined time period passes.

Tsurumaki teaches:

degrading the component when the point value stored in said memory falls below a reference value (paragraph [0033]) and adding an another predetermined point value to the point value stored in said memory, when a predetermined time period passes since a last addition of the point value (paragraphs [0023] through [0026]).

As per claim 13, Uchida discloses a component degradation method in which a disk array device, having a plurality of components degradable (Fig. 1) and a memory storing point values regarding each of the plurality of components (Fig. 2, element 12), comprises:

adding a predetermined point value from the point value stored in said trouble point storage unit and storing the added point value in said trouble point storage unit, when a processing fault occurs on the component (Fig. 4).

Uchida fails to explicitly disclose adding/subtracting a point value after a predetermined time period passes.

Tsurumaki teaches:

degrading the component when the point value stored in said memory falls below a reference value (paragraph [0033]) and subtracting an another predetermined point value to the point value stored in said trouble point storage unit, when a predetermined time period passes since last subtraction of the point value (paragraphs [0023] through [0026]).

As per claim 14, Uchida discloses a component degradation method in which a disk array device, having a plurality of components degradable (Fig. 1) and a memory storing point values regarding each of the plurality of components (Fig. 2, element 12), comprises:

subtracting a predetermined point value from the corresponding point value stored in said memory and storing the subtracted point value in said memory, when a processing fault occurs on one of the disks (Fig. 5)

degrading a corresponding disk when the point value stored in said memory falls below a reference value (col. 2, lines 63-67)

Uchida fails to explicitly disclose adding a point value after a predetermined time period passes.

Tsurumaki teaches:

adding an another predetermined point value to each point values stored in said memory, when a predetermined time period passes since a last addition of the point value (paragraphs [0023] through [0026]).

As per claim 15, Uchida discloses memory stores first point values and second point values regarding each of the plurality of disks (Fig. 2, element 12) said disk degradation method comprises: subtracting a first predetermined point value from the corresponding first point value stored in said memory and storing the subtracted point value in said memory, when a processing fault occurs on one of the disks (Fig. 5)

subtracting a second predetermined point value from the corresponding second point value stored in said memory and storing the subtracted point value in said memory, in a case where a processing time for a required processing exceeds a reference time on one of the disk (Fig. 5)

degrading a corresponding disk when the first point value stored in said memory falls below a first reference value or the second point value stored in said memory falls below a second reference value (col. 2, lines 63-67)

Uchida fails to explicitly disclose adding a point value after a predetermined time period passes.

Tsurumaki teaches:

adding an another predetermined point value to each point values stored in said memory, when a predetermined time period passes since a last addition of the point value (paragraphs [0023] through [0026]).

As per claim 16, Uchida discloses setting each point value corresponding to the defective disk stored in said trouble point storage unit to an initial value, in a case where a defective disk is replaced (Fig. 3).

As per claim 17, Uchida discloses method of restricting a drop in performance of a disk array device wherein a disk array device, having a plurality of disks (Fig. 1), a memory storing point values regarding each of the plurality of disks (Fig. 2, element 12) comprises: subtracting a predetermined point value from the corresponding point value

stored in said memory and stores the subtracted point value in said memory, when a processing fault occurs on one of the disks (Fig. 5)

lowering a processing rate of a disk in a case where the point value of the disk stored in said memory becomes equal to or lower than a reference value; setting the processing rate of the disk to a predetermined normal state in a case where the point value of the disk stored in said memory exceeds the reference value (col. 7, lines 21-30)

Uchida fails to explicitly disclose adding a point value after a predetermined time period passes.

Tsurumaki teaches:

adding some point value to each point value stored in said memory, when a predetermined time period passes since a last addition of the point value (paragraphs [0023] through [0026]).

As per claim 18, Uchida discloses disk array device further has a control unit (Fig. 1, element 10) controlling read processing and write processing on each of the plurality of disks (Fig. 1, element 31), comprises:

issuing an instruction to the control unit so that a processing rate of a disk is lowered in a case where it is detected that the point value of the disk stored in the memory becomes equal to or lower than the reference value, and issuing an instruction to said control unit so that the processing rate of the disk is changed to a predetermined normal rate in a case where it is detected that the point value of the disk stored in the

memory becomes greater than the reference value (col. 7, lines 21-30).

As per claim 19, Uchida discloses a computer program (col. 5, lines 41-47) for controlling a computer having of degradable component (Fig. 1) to act as:

a trouble point storage unit which stores a point value of the component; a point update unit which subtracts a predetermined point value from the point value stored in said trouble point storage unit and stores the subtracted point value in said trouble point storage unit, when a processing fault occurs on the component (Fig. 5)

a degradation unit (col. 2, lines 39-41) which degrades the component when the point value stored in said trouble point storage unit falls below a reference value (col. 2, lines 63-67)

Uchida fails to explicitly disclose adding a point value after a predetermined time period passes.

Tsurumaki teaches:

a trouble point recovery unit which adds an another predetermined point value to the point value stored in said trouble point storage unit, when a predetermined time period passes since the trouble point recovery unit had added to the point value a last time (paragraphs [0023] through [0026]).

As per claim 20, Uchida discloses a computer program (col. 5, lines 41-47) for controlling a computer having a plurality of degradable disks (Fig. 1) to act as:

a trouble point storage unit, which stores point values of each disk (Fig. 2, element 12)

a point update unit, which subtracts a predetermined point value from the corresponding point value stored in said trouble point storage unit and stores the subtracted point value in said trouble point storage unit, when a processing fault occurs on one of the disks (Fig. 5)

a degradation unit (col. 2, lines 39-41) which degrades the component when the point value stored in said trouble point storage unit falls below a reference value (col. 2, lines 63-67)

Uchida fails to explicitly disclose adding a point value after a predetermined time period passes.

Tsurumaki teaches:

a trouble point recovery unit which adds an another predetermined point value to the point value stored in said trouble point storage unit, when a predetermined time period passes since the trouble point recovery unit had added to the point value a last time (paragraphs [0023] through [0026]).

As per claim 21, Uchida discloses a computer program (col. 5, lines 41-47) for controlling a computer having a plurality of degradable disks (Fig. 1) to act as:

a trouble point storage unit, which stores point values of each disk (Fig. 2, element 12)

a point update unit, which subtracts a predetermined point value from the corresponding point value stored in said trouble point storage unit and stores the subtracted point value in said trouble point storage unit, when a processing fault occurs on one of the disks (Fig. 5)

a processing rate adjusting unit which lowers a processing rate of a disk in a case where the point value of the disk stored in said trouble point storage unit becomes equal to or lower than a reference value, and sets the processing rate of the disk to a predetermined normal state in a case where the point value of the disk stored in said trouble point storage unit exceeds the reference value (col. 7, lines 21-30)

Uchida fails to explicitly disclose adding a point value after a predetermined time period passes.

Tsurumaki teaches:

a trouble point recovery unit which adds an another predetermined point value to the point value stored in said trouble point storage unit, when a predetermined time period passes since the trouble point recovery unit had added to the point value a last time (paragraphs [0023] through [0026]).

Response to Arguments

Applicant's arguments filed June 08, 2007 have been fully considered but they are not persuasive.

In response to applicant's argument that the references fail to teach adding another predetermined point value, the Examiner respectfully disagrees. Tsurumaki

discloses adding a time delay value to an accumulation timer value (see Remarks, page 12). Applicant argues that Tsurumaki does not disclose a predetermined value, but rather a variable value. The Examiner would like to point out that given the broadest reasonable interpretation of the limitation of "predetermined value", does not entail a non-variable value, which has to be the identical in each process. Therefore the time delay value of Tsurumaki is a fixed or a predetermined value at the time of addition.

Applicant further argues that Tsurumaki fails to teach adding another predetermined point value, when a predetermined time period passes since the trouble point recovery unit had added to the point value a last time. The Examiner respectfully disagrees and would like to point out that to page 3, lines 3-5, and paragraph [0009], wherein Tsurumaki discloses *the function for specifying the magnetic disk which data transfer delay generates* ***continuously from the hour entry*** *concerning the data transfer for every I/O of all the magnetic disks* that constitute the logical disk supplied from the data delay monitor means of an array control circuit, and its specified separation instruction of a magnetic disk. The delay value (i.e. predetermined point value) is added in a continuous manner. Noting page 5, paragraph [0038], wherein Tsurumaki discloses the data delay in the data transfer between two or more magnetic disks is supervised. *By specifying the magnetic disk which data transfer delay generates continuously from the monitor result*, and publishing the separation instruction to the specified magnetic disk, reservation of the amount of data within the rapidity of a data transfer response *and a certain fixed time amount can be aimed*

at, and it is effective in the ability to make the rate of degeneration low and make dependability high.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1 .136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1 .136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Elmira Mehrmanesh whose telephone number is (571) 272-5531. The examiner can normally be reached on 8-4:30 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert W. Beausoliel can be reached on (571) 272-3645. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).